and other species, but whether for the seeds or soft, juicy pulp I could not determine, possibly for both.

Many of the small mammals and rabbits were given to gnawing the inside from the various species of globular cacti, which furnished a large quantity of pulpy material, with plenty of moisture. Several large specimens of these cacti were found that were mere shells. The mice, having entered from below, and without disturbing the position or appearance of the plant, had carried away all but the thorns and woody exterior.

Deer and antelope were rather common on the plains below camp, and, as they were seen daily and some individuals recognized by certain peculiarities, it was plain that if they left the region in search of water, it was not often or for any length of time, but more probably that they drew a large part of their moisture from their food. The different species of cacti and agave were frequently found with large pieces bitten out of them by these animals. The latter plant especially seemed to supply them with a large part of the necessary moisture.

The Indians and Mexicans living in the arid portions of the peninsula of Lower California told me that the rabbits and quail of those regions did not breed during dry seasons, the latter remaining in flocks throughout the spring and summer. This statement was verified by my own observations in the spring of 1887. No young quail or rabbits were seen, though the adults were everywhere abundant.

This habit may extend to other species in this region, as young birds seemed to me to be remarkably rare during the dry season mentioned.

Whether this habit arises from the fear that suitable food for the young may be wanting or that water in larger quantities than is to be obtained would be necessary for their early existence, I am unable to say.

Off the west coast of the peninsula, between 28° and 29° north latitude, are two islands — Cerros and Guadalupe — both of which are inhabited by large herds of wild goats, the descendants of domestic animals placed there by the whalers for the benefit of shipwrecked sailors; there are also quite a number of deer on Cerros.

On both of these islands water is found in small quantities. But during dry seasons this becomes so scarce that the large herds of Guadalupe especially suffer considerably. The sealers of that coast told me, however, that during seasons of little rain the goats drank sea-water and managed to exist until better times. This story was looked upon as a sailor's yarn, without foundation, until endorsed, in part at least, by my brother, who returned from a trip along the coast of the peninsula in June, 1892.

Goats were found on Natividad Island, a small island south of Cerros, which is known to contain no fresh water. As they were out of fresh meat, a few were shot for use on board the schooner, and a kid about one-third grown was captured and taken on board as a pet. Fresh water was offered it, supposing it would be a very acceptable variation to its fare of dry weeds; but, strange to say, after the first sip, it shook its head in disgust, and turned away. Sea-water, however, was accepted and regularly drunk. Gradually it formed a liking for fresh water, and at the end of a month would not pay any attention to salt water. That goats are rather scarce on Natividad would indicate that they did not thrive on sea-water; yet those that were killed by my brother were fat and in every way in good condition.

The story that prairie-dogs have in each colony one or more burrows reaching to water has been widely spread and is probably not without foundation; but that such is the case wherever prairie-dogs are found is by no means true. I witnessed the sinking of a well in southwestern New Mexico, in the midst of a very large colony of these rodents, the supposition being that, where "dogs" were so abundant, water could not be far from the surface. After a depth of over two hundred feet had been reached, the work was given up and the bottom reported as the dryest spot in New Mexico. In sinking to this depth, several strata of tough, slaty clay were cut that would have undoubtedly proved an impassible barrier to any burrowing rodent, had it even penetrated to that depth.

Prairie-dogs are undoubtedly fond of water when it can be obtained. I have frequently, in Colorado, found their colonies near streams, to which well-beaten trails led, and where large numbers were seen drinking daily. But where water is not to be obtained, they seem to be able to subsist upon what moisture they can get from the dry, scanty vegetation of the arid regions in which they live.

A. W. ANTHONY.

Denver, Colo., Feb. 7.

Bad-Air Indicator.

PERMIT me to suggest, through your columns, something desirable to be invented if it be within the limits of science to produce it, namely, an automatic and reliable indicator of bad air. I do not in the least know whether such a thing can be made, and must admit that the only chemist to whom I have proposed the matter sees no way to construct it, but it is possible that some one might see his way clear to it. My idea is to have a plain circular disc, which might be made ornamental, which should be one or two feet in diameter, which should be placed on the walls of a room or hall, and the surface of which should be pure white when the air of the room is reasonably pure, but which should become discolored by the presence of bad air, and the color of which should deepen or darken in proportion as the impurity in the air increased. It seems to me that such an indicator, plainly making its announcement before the eyes of all, would be valuable. It may be said that our sensations are sufficient indicators of the presence of foul air, but this, I think, is not so, and the vitiation of the air in many a hall is so gradual and insidious that the great number of people may, without knowing it, be gradually forced to breath air which is most poisonous, and nearly every particle of which — to state the matter plainly — has been previously many times breathed into and out of other people's lungs. Cannot some substance or surface be so chemically prepared as to give this, the above-mentioned, indication? Is not here a good chance for the chemist and inventor?

C. H. AMES.

Boston, Mass, Feb. 10.

On Chelydra serpentina.

THE snapping tortoise is not one that appeals to many as an animal of which to make an attractive pet. His appearance and his manner of receiving advances are decidedly against improvement of a reputation that contains little of the good. There is a widespread opinion that he is quite intractable, utterly savage and ferocious, and without redeeming traits. My own ideas on the subject, however, have been greatly modified by the behavior of a seventeen-inch specimen kept in a tank in a corner of one of the rooms in this museum, where he furnished a good deal of entertainment for visitors, during the summer and autumn of last year. The sulkiness brought with him gradually vanished until he began to take food from long forceps; later he would accept meat from the fingers; and still later would come out of the tank for something to eat. Eventually he gained confidence enough to traverse a forty-foot room for a sparrow, a mouse, or a snake that might be offered. He seized the food held out for him in his jaws, turning his head to one side, if necessary, to do so with advantage, then he turned himself about and, high on his legs, like a little elephant, with the hinder inch or two of his tail bearing on the floor, marched gravely back to his miniature pond. Sometimes the fur or feathers of prey stood up or covered his eyes so as to prevent seeing distinctly. No matter, the jaws never loosened their grip and their owner blundered along banging against anything in the way till from one side or the other he at last managed to get into the water. Wherever food was given him, his only place to eat it was under the surface in his tank. Firmly held between the jaws whatever he wished to eat was torn in pieces by the claws of his fore feet, or, if too tough for tearing, it was at least reduced to such shape as admitted of swallowing entire. After a time "Snap," as he was named, became rather too familiar, coming out of his retreat at all times, whether called or not, whenever one entered the room. If a student came in and took a seat at a table, Snap was pretty sure to plant himself under the chair or at the feet of the newcomer to remain for an hour, more or less, as pleased him. Pushed aside,

he either lay quiet or rose and stalked back to his own corner as if offended. Some might take it that his conduct indicated a fondness for company, or the possession of grateful feelings, or even an affectionate disposition; but it is not necessary in explanation of Snap's deportment to go beyond his desire for food. In the satisfaction of his hunger his interest in human beings departed. His doings are here put forward in support of nothing except that with proper treatment the snapping tortoise, one of the lowest and least likely of the tortoises, may lose his timidity, his ferocity disappearing in consequence, and become susceptible of a considerable amount of training. S. GARMAN.

Mus. Comp. Zoöl., Cambridge, Mass.

Snow Rollers.

THE article of Dr. Claypole, in *Science* No. 522, on "Snow Rollers," recalls what I saw a few years ago. The condition was like that described by Mr. Hart. There was a smooth crust of snow on which a light fall of damp snow fell. The wind changed suddenly to the north, blew hard, and I saw scores and perhaps hundreds of these snow rollers forming. The wind simply blew them along and they formed just as boys roll snowballs. I feel sure such occurrences are not uncommon here. These rollers were several inches in diameter. D. S. KELLOGG.

Plattsburgh, N. Y., Feb. 9.

The Antiquity of Man.

IN "Current Notes on Anthropology.—xxii." (*Science*, Feb. 10, 1893), Dr. Brinton has referred to certain discussions that took place at the meeting of the German Anthropological Association last August. Not having yet seen the report of that meeting, I cannot judge how far Dr. Brinton may have been misled by his authorities, but I wish to enter a decided protest as to two statements made by him. Let me premise by saying that it seems to me that it behooves Americans to maintain a strict neutrality in the international jealousies between the Germans and the French.

In regard to the importance to be attached to the celebrated "Neanderthal skull," it seems to be sufficient that it has been adopted by De Quatrefages and Hamy to set all the Germans, except Schaffhausen, against it. I did not expect, however, to find an American using such language as this about it: "The Neanderthal skull . . . was not dug up at all, but was picked up in a gully, which had been washed in the mountain side, and came from dear knows where. Probably there had been an old graveyard further up the hill, but by no means one in quaternary times." I will quote the exact language of Dr Fuhlrott, the discoverer, describing the circumstances under which it came to light. "In a wild ravine, called the Neanderthal, cleft in the Devonian limestone, is a small cavern, about eleven feet long, ten broad, and eight high, opening upon an almost vertical wall of rock about sixty feet above the level of the stream [flowing through it]. . . . The ravine has been quarried for marble. In the cavern is a bed of clay, a glacial deposit, almost as hard as stone. In this clay, at a depth of two feet, in August, 1856, a human skeleton was discovered."etc. (Hamy, "Précis de Paléontologie Humaine," p. 237). The real question in regard to these human remains is, in the words of Schaffhausen, "Whether the cavern in which they were found, unaccompanied with any trace of human art, were the place of their interment, or whether, like the bones of extinct animals elsewhere, they had been washed into it" (*Natural History Review*, 1861, p. 172). In all serious discussions it is well to stick close to the facts of the case.

The other subject, about which I dissent from Dr. Brinton's conclusions, is in regard to what he calls "the delineation of a mammoth on a bone from the Lena cave in the south of France. This was not discussed, being probably considered of questionable origin." I must own that at first I was somewhat puzzled to know just what Dr. Brinton meant by "the Lena cave in the south of France." But on looking into the recently published English translation of the Marquis de Nadaillac's "Prehistoric Peoples," p. 119, Fig. 38, sure enough, I found an engraving representing a "Mammoth or elephant from the Lena cave." Now this remarkable designation is not due to the author, who calls it a "Mammoth ou elephant de la Lena," referring to the well-known discovery in 1799 of the body of a mammoth, imbedded in the frozen banks of the river Lena, in Siberia. I suppose that scarcely any relic of antiquity is better known to pre-historic archæologists than the remarkable delineation of a mammoth upon a plate of fossil ivory, discovered by Edward Lastet, in May, 1864, in the cavern of the Madelaine (Dordogue), in southern France. It was made in the immediate presence of M. de Verneuil and of Dr. Falconer, and an account of the circumstances of the discovery was given by him in a letter to Milne Edwards, published in the *Annales des Sciences Naturelles*, 5e. ser., T. iv. (Zoöl.), 1865, pp. 353–356. That even international jealousy should "question its origin" surpasses belief. HENRY W. HAYNES.

Boston, Feb. 16.

Birds in Severe Cold Weather.

DURING the recent severe cold weather, as one of the high-school students was on his way through the belfry of the building to hoist the weather signals, he discovered a small bronze owl perched above one of the windows. It had evidently been drawn thither by the heat from the chimneys and pigeons which frequent the ventilators. On being captured by the janitor, on the day following, the bird made no resistance. It was put into a cage, to be kept for the zoölogy class. It lived but one brief day, and it was found to be emaciated and evidently died of weakness and sheer exhaustion. The taxidermist who stuffed it said that it was only one of a large number recently brought to him as victims of the cold spell. Many were found frozen in barns, and had been driven by the cold from the woods to the city.

Large numbers of snow-birds, crows, as well as English sparrows, were hovering about grain elevators, the glass works, and other similar buildings for warmth and food all through the cold period. The gathering of birds about warm chimneys, etc., in such large numbers was something unusual.

E. R. WHITNEY.

Binghamton, N.Y.

Miocene Group of Alabama.

SINCE sending you a contribution on the Miocene Group of Alabama, Dr. Wm. Dall of the Smithsonian, to whom the fossils collected had been submitted, has returned his report, naming the most of them and declaring his opinion, that they are rather of the older than a younger Miocene. This will better suit the geographical position and other facts detailed of the Grand Gulf. His final determination will be published in the Alabama Report. LAWRENCE C. JOHNSON.

Meridian, Miss., Feb. 13.

Mule-footed Hogs.

MR. J. F. RITTER of Higginsville, Mo., sends me a hog's foot, which to me is something new. It has the two larger hoofs united into one. The bones above are separate but the hoofs wholly united. He states that a farmer of the vicinity has a drove of these mule-footed hogs. By crossing breeds he has some with two cloven feet and two mule feet. I should like to know whether this is a common occurrence, or is it something new? JNO. H. FRICK.

Warrenton, Mo., Feb. 11.

BOOK-REVIEWS.

A Manual of Bacteriology. By GEORGE M. STERNBERG, M.D. New York, William Wood & Co. 886 p. 8°. $7.

THE results of the bacteriological investigation of the past decade, when massed in a huge volume like the one before us, are calculated to arouse the keenest admiration for the talent and industry that have produced them. Even in this period of breakneck *temps* in all lines of human activity and thought the progress of bacteriology seems to the world at large truly marvellous. Every year, we may almost say every month, witnesses some discovery of untold practical value. If a last word had